CLAIMS

1. A ceramic circuit board prepared by integrally joining a circuit layer composed of a clad member including an Al plate and an Al-Si brazing material to a ceramic substrate, wherein a surface of the clad member adjacent to the Al-Si brazing material is joined to the ceramic substrate with an Al alloy film therebetween, the Al alloy film having a thickness of less than 1 μm and being provided on the surface of the ceramic substrate.

2. The ceramic circuit board according to claim 1, wherein the ceramic substrate comprises an aluminum nitride sintered body, a silicon nitride sintered body, a silicon carbide sintered body, or a sialon sintered body.

3. The ceramic circuit board according to claim 1, wherein the Al content of the Al-Si brazing material is 85 mass percent or more and the Si content of the Al-Si brazing material is in the range of 6 to 15 mass percent.

4. The ceramic circuit board according to claim 1, wherein the Al alloy film comprises at least one rare earth element selected from Y, Sc, La, Ce, Nd, Sm, Gd, Tb, Dy, Er, Th, and Sr in an amount of 1 to 5 atomic percent.

5. A method for producing a ceramic circuit board prepared by integrally joining a circuit layer composed of a clad member including an Al plate and an Al-Si brazing material to an Al alloy film, wherein said circuit layer composed of the clad member including the Al plate and the Al-Si brazing material and a ceramic substrate having the Al alloy film thereon overlap with each other, and said circuit layer and said

ceramic substrate are then joined by heating at a temperature of 580°C to 630°C in an atmosphere of vacuum of 10^{-2} Pa or lower while a pressing load is applied to the overlapped the clad member and the ceramic substrate so that the pressure of the load is 2 kg/cm^2 or more.

6. A power module comprising:

a ceramic circuit board prepared by integrally joining a circuit layer composed of a clad member including an Al plate and an Al-Si brazing material to a ceramic substrate, wherein a surface of said clad member adjacent to said Al-Si brazing material is joined to said ceramic substrate with an Al alloy film therebetween, said Al alloy film having a thickness of less than 1 μm and being provided on the surface of said ceramic substrate;

a semiconductor element mounted on said circuit layer; and

a heat sink that dissipates heat generated from said semiconductor element via said ceramic circuit board.